Fatal Cutaneous Mucormycosis in a Diabetic Woman: Case Report

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Abstract

Mucormycosis is a rare and fatal infection that generally affects the patients who are immunocompromised. Despite antifungal therapy and aggressive surgical intervention, mucormycosis can cause serious and rapidly fatal infections if delayed diagnosis or therapeutic management occurs. Here, we report cutaneous mucormycosis in a diabetic woman, with an unfavourable outcome due to late diagnosis and lack of aggressive treatment.

A 50-year old diabetic woman, some days after her admission into the hospital for complications of diabetes presented with periorbital cellulitis with echymotic lesion over forehead and both hands including thumb.

With diagnosis of "periorbital cellulitis" intravenous antibiotics were started but no improvement was observed. The result of direct microscopy and culture of the wound exudate led us to a diagnosis of mucormycosis. Due to delayed diagnosis, she succumbed to her illness.

Due to the high mortality rate of mucormycosis, early diagnosis based on clinical findings and laboratory evidences could be effective for management of the patients suffering from this infection.

Keywords: Cutaneous mucormycosis, Lid lifting, Non-septate fungal hyphae, Periorbital cellulitis, Uncontrolled diabetes.

Introduction

Mucormycosis (Zygomycosis) is a rare, opportunistic fungal infection, occasionally fatal caused by mucorales, of the class zygomycetes[1]. This fungus is widespread and occurs in soil, manure, vegetable, fruits and as bread mould. In India, mucormycosis is overwhelmingly associated with uncontrolled diabetes with or without ketoacidosis.[2]

Early diagnosis and treatment of mucormycosis is extremely important due to the aggressive course of the disease. Control of underlying disease must be established, metabolic abnormalities corrected and antifungal therapy should be combined with surgical debridement of all necrotic tissues.[3] Here we report a case of cutaneous mucormycosis presenting with periorbital cellulitis.

Case Presentation

Our case was a 50 years old obese lady from a remote village of Sivasagar district, Assam. She was a previously diagnosed case of Type 2 diabetes mellitus with nephropathy on oral hypoglycaemic for 15 years and on insulin for last 4 years presented to medicine out-patient department with fever, loose motion and decreased urine output for 3 days and swelling of both lower limbs as well as facial puffiness for 1 day. Her attendant told that she was also having tingling & numbness of the limbs, diminished vision, history of recurrent skin infection and altered bowel habit.

On examination, she was found disoriented with positive signs of pallor, pedal oedema and gangrenous tip of left thumb with no signs of icterus, cyanosis or clubbing. Pulse rate was 84/minute, regular and normovolumic; Arterial pressure was 110/70mm Hg. Cardio-vascular, respiratory system and per abdominal examination did not reveal any abnormality. A provisional diagnosis was made as Type 2 Diabetes mellitus with peripheral neuropathy with peripheral artery disease (atherosclerotic amputation of left toes) and was admitted in Medicine ward. Written informed consent was obtained from the attendant (as patient was disoriented) for publication of this case report and accompanying images.

Laboratory findings shown in Table I. Treatment were initiated with intravenous Pipercillin/ Tazobactum (4.5g every 8 hours), Ofloxacin (500mg/100mL 12-hourly) and Ornidazole (500mg/100mL 12-hourly) infusion, diuretics and subcutaneous Insulin. As control over blood sugar was achieved, Insulin was stopped and switched to Oral Hypoglycemic agents on day 6. On day 7, echymotic lesions over forehead along with both hands including thumb were observed and provisionally diagnosed as periorbital cellulitis. Antibiotic regimes was replaced with Meropenem (500mg intravenous every 8 hours) and Linezolid (600 mg intravenous every 12hr) but no improvement was observed. The periorbital area gradually became black necrosed Eschar (Fig. 1) by the day 15. Intravenous Fluconazole was started at a dose of 200mg daily. Incision and drainage done under local anaesthesia, and exudate sent for direct microscopy and culture and sensitivity to the microbiology laboratory. The potassium hydroxide mount of the exudate revealed broad non-septate fungal hyphae with branching at right angles (Fig. 2). Culture on Sabouraud dextrose agar on incubation at room temperature revealed filling of culture dish by greyish-white, aerial mycelial growth

with a woolly texture after 72 hours with typical "lid lifting pattern". (Fig. 3)

Based on the above findings a final diagnosis of cutaneous mucormycosis with periorbital cellulitis was achieved. Immediately she was placed on systemic antifungal Amphotericin B (1mg/kg) but finally she succumbed to her illness.

Table 1: Laboratory investigation results

At the time of admission	Haemoglobin – 7.6 gm%, ESR-140 mm AEFH, WBC-30000 per µL, PMN-10%, Lymphocytes 90%, Serum Sodium-124.6 mmol/L, Serum Potassium- 5.68 mmol/L, Random Blood Sugar - 256 mg% Serum Urea- 114.2 mg%, Serum Creatinine- 3.9 mg%, Serum T_3 – 2.0 , T_4 -7.2 TSH- 3.5 Urine routine examination: Sugar : 2+, Pus cell: 2-3/HPF, RBC: 1-2 /HPF USG whole abdomen: No abnormality detected. Blood and urine sent for culture & sensitivity and found sterile. CT scan nose and PNS: Bilateral frontoethmoidal sinusitis, Left sided acute on chronic mastoiditis, Deviated nasal septum. Stool for occult blood found positive.
Day 2	Fasting Blood sugar- 584 mg%, PPBS- 650 mg%, HbA1C- 10.41 mg% Serum Sodium-134.5 mmol/L, Serum Potussium- 2.80 mmol/L, Serum Urea- 128.5 mg%, Serum Creatinine- 3.0 mg%,,
Day 6	Fasting Blood sugar -158 mg/dl, Serum Urea- 156.2, Serum Creatinine- 2.9 mg/dl
Day 13	Fasting Blood sugar 146 mg/dl
Day 14	Fluctuant swelling over scalpe- needle aspiration shows haemorrhagic collection CT brain: Subcutaneous edema of Scalpe area and pre-septal region.
Day 18	Serum Urea: 105.42 mg%, Creatinine: 2.22 mg%, Total Protein: 4.6 Albumin: 2.6 Prothrombin time: 12.6 sec INR 1:0

ESR- Erythrocyte sedimentation rate, AEFH- After end of first hour, WBC- white blood cell, PMN- Polymorpho-nuclear neutrophil, TSH- Thyroid stimulating hormone, PPBS- Postprandial blood sugar, PNS- paranasal sinuses.

Fig. 1: Black necrotic eschar

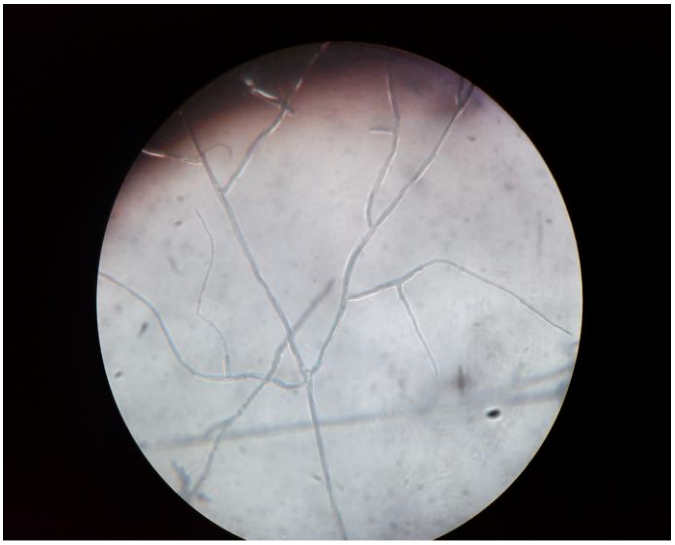

Fig. 2: Broad non-septate fungal hyphae (KOH mount)

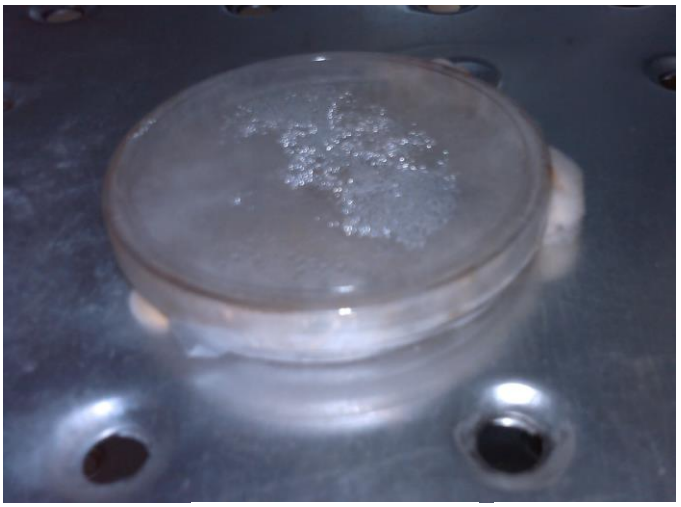

Fig. 3: Growth on Sabouraud dextrose agar (lid lifting pattern)

Discussion

Mucormycosis caused by Zygomycetes is a rare and fatal infection that generally affects the patients who are immune-compromised. It generally affects almost exclusively the patients with known predisposing conditions, such as poorly controlled diabetes, long term treatment with of steroid, antibiotics and cytotoxic agents, leukemia, lymphoma, organ transplantation, severe burns, hemochromatosis and use of deferoxamine and possibly malnutrition considering the majority of cases occurring in the developing nations[4,5].

Depending on the immunological status of the patient, the disease may manifest in six different ways depending on the affected site as rhino-cerebral, pulmonary, cutaneous, gastrointestinal, central nervous system or disseminated forms. The infection develops after inhalation of fungal sporangiospores into the paranasal sinuses. The infection may then rapidly extend into adjacent tissues. Upon germination, the invading fungus may spread inferiorly to invade the palate, posteriorly to invade the sphenoid sinus, laterally into the cavernous sinus to involve the orbits, or cranially to invade the brain.[6] A black necrotic eschar is the hallmark of mucormycosis.[7]

However, the absence of this finding should not exclude the possibility of mucormycosis. Fever is variable and may be absent in up to half of cases. The white blood cell count is typically elevated as long as the patient has functioning bone marrow. Preoperative contrast-enhanced CT is useful in defining the extent. Such CT scans show the oedematous mucosa, fluid filling the ethmoid sinuses, and destruction of periorbital tissues and bone margins.[8] Histopathological examination of surgical specimens can confirm the clinical diagnosis with the appearance of right-branching aseptate hyphae, which are considered typical of Mucor species, along with evidence of angioinvasion and tissue necrosis.[9] Fungal cultures provide further confirmation.[10]

In this study, nosocomial pattern of the infection cannot be ruled out as the diagnosis of mucormycosis was done after a fortnight of hospital stay of the patient and which is probably due to her immunocompromised state.

Conclusion

Mucormycosis still remains a poorly understood disease with high mortality rate. This case report is to draw attention of the clinicians and to emphasize the need for high index of suspicion. Rapidly progressive nature of the disease with a fulminant course and fatal outcome indicates the need of early diagnosis and prompt treatment. Though prognosis is dependent on multiple factors, early initiation of treatment is an important element.

Conflict of Interest: None

Source of Support: Nil

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